



# News Release

## Defense Advanced Research Projects Agency

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3701 North Fairfax Drive  
Arlington, VA 22203-1714

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IMMEDIATE RELEASE

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### **DARPA TO PUSH REVOLUTIONARY EFFICIENCIES FOR MID-WAVE INFRARED LASERS**

The Defense Advanced Research Projects Agency (DARPA) has announced the availability of funding for the development of highly efficient mid-wave infrared lasers. The new program, known as Efficient Mid-wave Infrared Lasers (EMIL), will drive the efficiency of such lasers more than an order of magnitude beyond the state of the art, with a goal of greater than 50 percent efficiency.

The program is outlined in a recently issued broad agency announcement (BAA 06-20) and accompanying proposer information pamphlet. To be considered for the initial round of funding, proposal abstracts are due by April 12; full proposals are due by June 21. Full details are available in the announcement and pamphlet (see below for website posting locations).

The specific technical goals of the EMIL program are to demonstrate a mid-wave infrared laser operating continuous wave at room-temperature with high-power (i.e., more than one watt), good beam quality, and operating at 50 percent efficiency. This would mean that a total of no more than two watts of electrical power is required to generate the one watt of laser output power.

Current mid-wave infrared lasers have wall-plug efficiencies that rarely exceed a few percent and poor operating characteristics at room temperature. In contrast, today's near infrared semiconductor lasers have now achieved high-power output at room temperature with excellent beam quality and with wall-plug efficiencies that now exceed 50 percent. The EMIL program's key challenge will be to develop mid-wave infrared laser sources that have similar performance levels to those already demonstrated by near infrared lasers.

Near infrared and mid-wave infrared refer to the wavelength of the laser's light. The wavelength of the most efficient near infrared lasers is about 0.8 microns, just beyond what can be seen with the human eye. The EMIL program defines mid-wave infrared lasers as those that operate at wavelengths between 3.8 and 4.8 microns.

Mid-wave infrared lasers are used for military countermeasure and chemical and biological threat detection systems. The revolutionary improvements in efficiency that will be achieved in the DARPA program will result in enormous improvements in the size, weight, performance, and cost of future versions of these military systems.

(more)

“Because of its transparency, the mid-wave infrared is rapidly becoming an exciting region of the electromagnetic spectrum,” said Dr. Mark Rosker, DARPA program manager. “We are just now beginning to understand how to build compact sources to exploit it. The challenge DARPA is making in EMIL will demand a complete rethinking of why these lasers work so inefficiently and dissipate so much wasted power. According to Dr. Henryk Temkin, DARPA program manager, “Once we overcome these problems, we will start a revolution in infrared photonics just as efficient near infrared diode lasers have fueled a revolution in photonics.”

Organizations interested in proposing approaches for EMIL should obtain the solicitation and the proposer information pamphlet for further details. Both are available on the Federal Business Opportunities and Federal Grants websites, see <http://www.fbo.gov/spg/ODA/DARPA/CMO/BAA06%2D20/listing.html> or <http://www.grants.gov/search/search.do?mode=VIEW&oppId=8167>.

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Media with questions, please contact Jan Walker, (703) 696-2404, or [jan.walker\[at\]darpa.mil](mailto:jan.walker@darpa.mil). Contractors or military organizations, contact Dr. Mark Rosker at (571) 218-4507 or Dr. Henryk Temkin at (571) 218-4618.